Pleistophora[1] sp. (Microsporidia: Nosematidae): A New Parasite of Shrimp

In a recent study of parasites in shrimp from Galveston Bay, Texas, four white (*Penaeus setiferus*) and four brown (*P. aztecus*) shrimp were found infected with a microsporidian belonging to the genus *Pleistophora*. Although several species of Microsporidia have been observed in the musculature of penaeid shrimp (B. Eldred, R. M. Ingle, K. D. Woodburn, R. F. Hutton, and H. Jones, *Prof. Pap. Ser. Mar. Lab. Fla.* No. 3, 139, 1961; V. Sprague, *Occ. Pap. Mar. Lab., La. St. Univ.* 5, 1–8, 1950; E.

[1] According to the Law of Priority (Art. 23) of the International Rules of Zoological Nomenclature, *Pleistophora* Gurley, 1893 has priority over *Plistophora* Labbé, 1889, a junior synonym.

Iversen and R. Manning, *Trans. Amer. Fish. Soc.* 88, 130–132, 1959; E. Iversen and N. Van Meter, *Bull. Mar. Sci. Gulf Carib.* 14, 549–553, 1964), there are no published reports of the genus *Pleistophora* in shrimp.

The shrimp examined in this study were obtained from local fishermen and usually were frozen when brought to the laboratory. Shrimp infected with *Pleistophora* sp. appeared similar to those infected with *Nosema* sp. The dorsal epidermal layer was blue-black, and focal areas of blue discoloration were sometimes visible in the cut surface of muscle. Abdominal segments of uninfected shrimp were transparent and firm, but those of specimens heavily infected were opaque and flaccid.
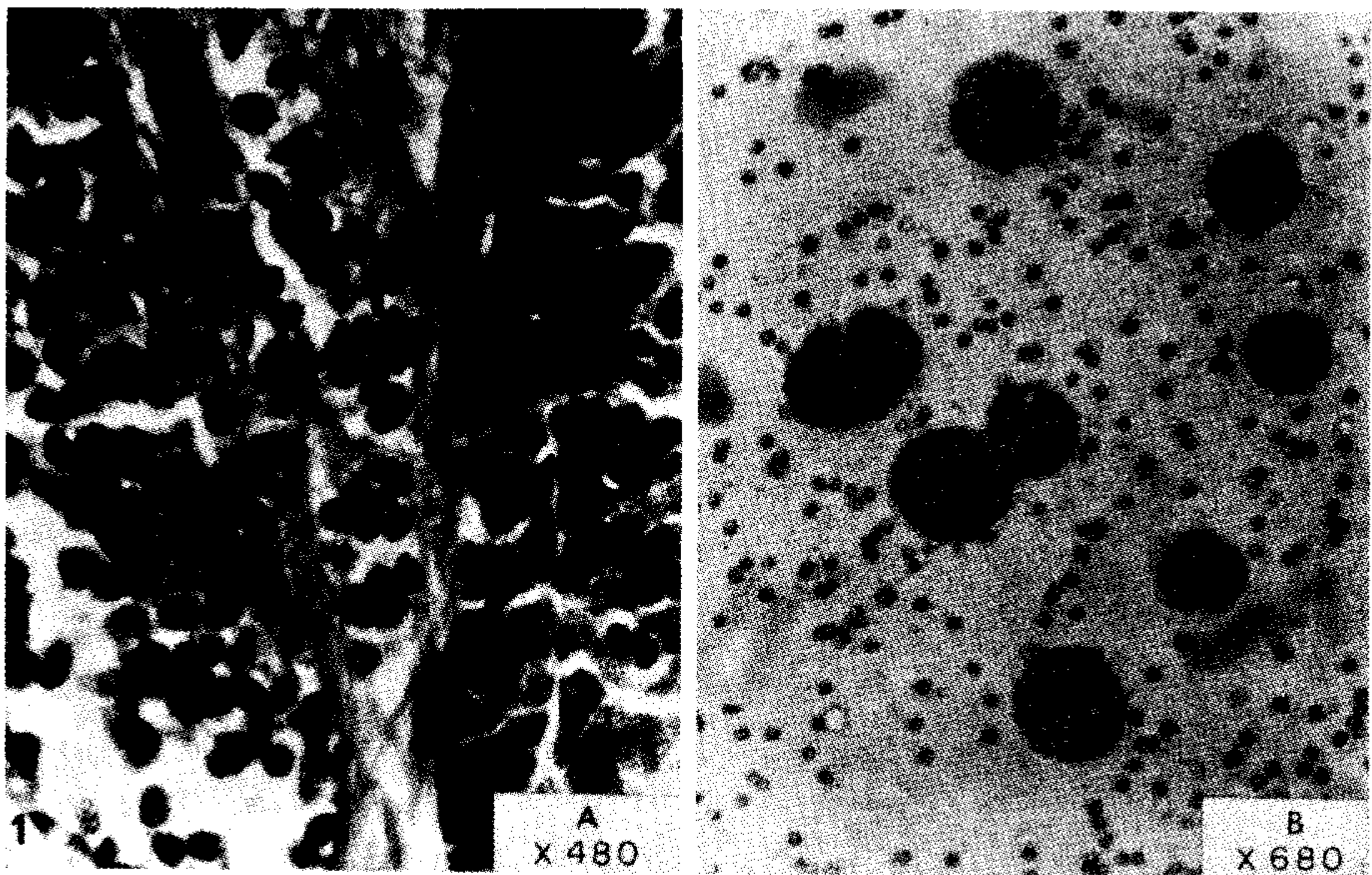

FIG. 1. *Pleistophora* sp. in white and brown shrimp: (A) striated muscle of a white shrimp, hematoxylin and eosin stain; (B) dab smear showing sporonts in brown shrimp, Giemsa's stain.

For microscopical examination, the exoskeleton of parasitized shrimp was removed, and a transverse section of a body segment, 4–8 mm in thickness, was excised and fixed in 10% formalin. Paraffin sections were prepared histologically and stained with hematoxylin and eosin. Select sections and dab smears from freshly cut muscle fixed in 95% alcohol and dried were stained by the routine Giemsa method.

"Cysts," developing stages of the parasites, and spores were numerous in the muscle sections (Fig. 1A) where they often ruptured the muscle fibers and infiltrated the intramuscular space, and in the dab smears (Fig. 1B). Cysts varied in size but contained 40 or more spores which, at the periphery of the cysts, appeared to be palisaded.

Microsporidia were present in tissues other than striated muscle. In a single shrimp, they were observed in the cardiac muscle (Fig. 2A), pericardium, wall of the stomach (Fig. 2B), and the hepatopancreas (Fig. 2C). Dab smears from the shrimp illustrated in Fig. 2C had many *Pleistophora* sp. cysts similar to those shown in Fig. 1B.

Our study provided no indication as to how the microsporidians were disseminated through the body of a shrimp. Little evidence of tissue damage was apparent in the hepatopancreas, cardiac muscle, or intestinal tract. Because all specimens studied were heavily infected, we have no information concerning the rate of proliferation in shrimp.

Based on our observations, *Pleistophora* sp. occurred less frequently than *Nosema nelsoni* in shrimp from Galveston Bay. Both species, however, infect brown and white shrimp.

KENNETH N. BAXTER[2]
Bureau of Commercial Fisheries
Biological Laboratory
Galveston, Texas

R. H. RIGDON
CONSTANCE HANNA[3]
The University of Texas Medical Branch
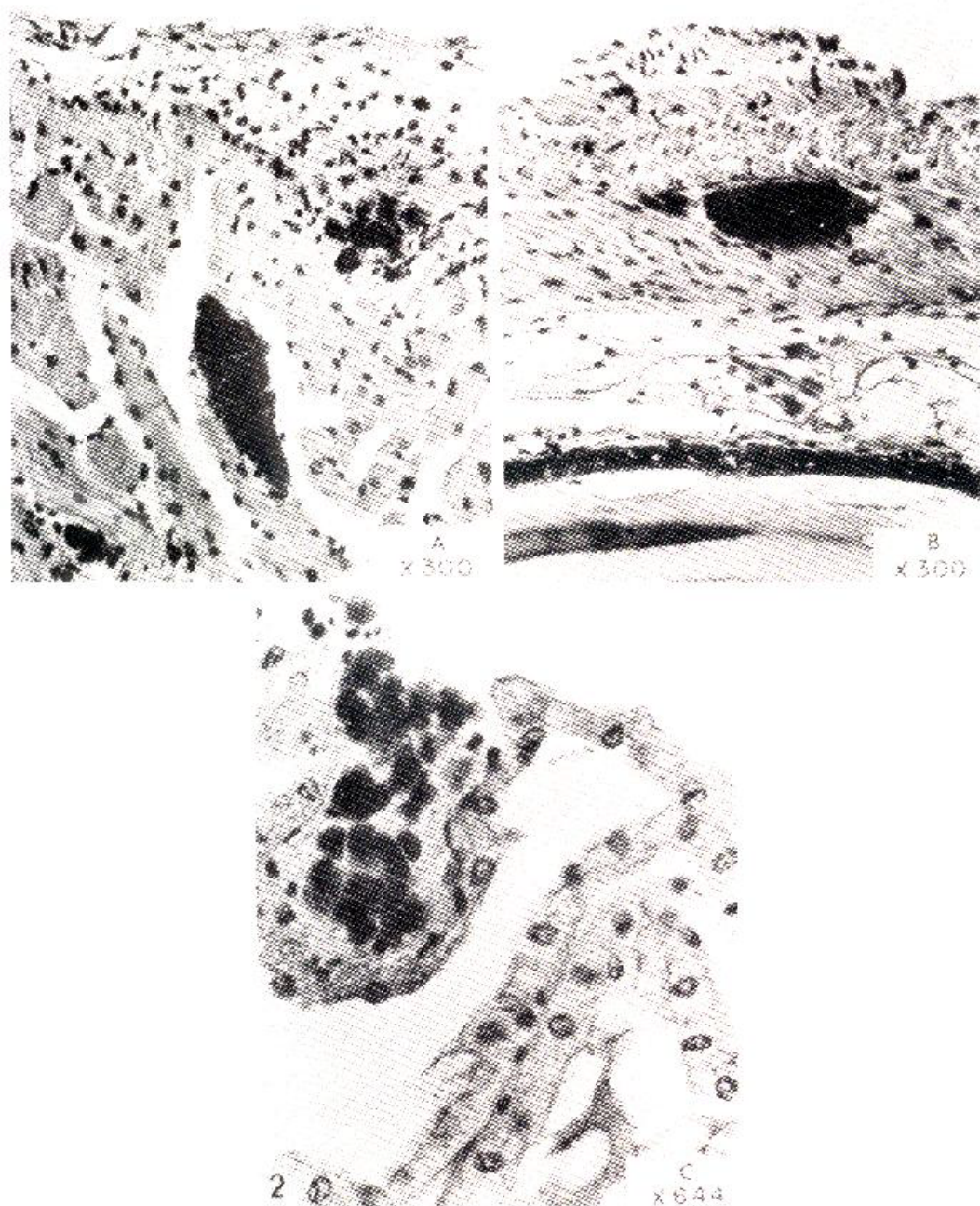*Galveston, Texas*

FIG. 2. *Pleistophora* sp. in various organs of brown shrimp, hematoxylin and eosin stain. (A) cardiac muscle; (B) stomach wall muscle; (C) hepatopancreas.